Oersted and the Discovery of Electromagnetism. Bern Dibner. Blaisdell Publishing Company, New York, 1962. Pp. 85. Illustrated. Price $3.50 clothbound, $1.95 paperbound.

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This little volume is particularly pertinent at this time since one of the present emphases of the American Institute of Physics is on the preservation of historical material from estates of prominent physicists, past and present. Such questions as what caused a certain individual to think along certain lines or to make certain suggestions have not been too clear, and an effort is being made to learn this from those who are still in our midst. Even in this volume, the details of the actual experience of Oersted in finding the interaction between a wire carrying a current of electricity and a magnetic needle are still in doubt, as the author indicates. Oersted himself did not describe his experiences in such a manner as to make the steps clear in this experience. It was a very happy surprise to this reviewer to realize that Oersted was a friend of Faraday and knew him rather intimately over a period of some 25 years. In many Physics classes, Faraday's electromagnetic induction principle and Oersted's interaction are treated separately without their complementary nature being noted.

Furthermore, the individuals who selected Oersted's achievement to grace the medal that has been awarded to outstanding Physics teachers each year since 1936 certainly are to be commended in their choice. If each one is to emulate Oersted, they will be choosing a scientist and a citizen, for Oersted was one who "threw himself into broadening the field of science education . . . founded a society for the dissemination of scientific knowledge . . . delivered lectures on science in the principal cities of Denmark . . . gave them in French, also . . . lectured in Norway, addressed a science society in Berlin, visited Hamburg and called upon the celebrated electricians and experimenters in Gottingen."

In England, Oersted knew men like Sir Humphry Davy and Brewster. Oersted had almost a father-son relationship with Hans Christian Anderson, the compatriot, who met Oersted when he was 14 years of age. Anderson dined in the Oersted home a certain day of each week, and this tradition was continued by Mrs. Oersted for 24 years after her husband's death. Anderson took impish delight in referring to Oersted as the great Hans Christian and to himself as the little Hans Christian.

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But I am getting ahead of my story. The book is a story description of the epoch that began in 1800 when Alesandro Volta made his discovery of a method for producing a continuous electric current.

However, most of us have not followed the intervening experiments to the point where John Children, in 1809, constructed a battery of 20 pairs of copper and zinc plates, each plate 6 feet long and 2 feet 8 inches wide. With this battery, Children was able to render a pair of platinum ⅛ inch square and 2¼ inch long red hot by the current.

This experiment opened a whole new field for investigators since they now had a roughly constant DC source. Oersted's earlier experiments were unimpressive probably because he laid the conducting wire across the copper needle instead of parallel with it. However, in 1820, during a private lecture before a group of advanced students, he happened to place the conductor carrying the current over and parallel with the needle. Oersted observed the needle to swing strongly aside as though a magnet had been close to it. Concerning the earlier remarks in this review, Oersted's failure to publish a detailed account of how he came upon the discovery, the time and place, etc., left an area of uncertainty that has never been filled. Five general accounts have been left to us by Oersted, the earliest of which was published in Danish before April, 1821, in the review of the *Royal Danish Society of Sciences from May, 1820 to May, 1821.* In one of his accounts, Oersted noted that "all of his auditors are witnesses that I mentioned on the result of the experiment beforehand. The discovery was not made by accident as Professor Gilbert has wished to conclude from the expression I used in my first announcement."

The lesson one might learn from this is that a researcher, in order to establish priority and help others so engaged to seek truth, should strive to be more explicit about the procedures he followed while they are fresh in his mind. On the other hand, while one is engaged in exciting research, he may find that excessive detail at that particular point is irrelevant to his train of thought. It may be, too, that the researcher has become so familiar with what he is doing that he fails to see the difficulty that those

less familiar with the experiment have in reconstructing the experience.

The news of his research traveled swiftly and Ampere, Professor of Mathematics in Paris, mathematically analyzed Oersted's work, added experiments of his own, and was able to formulate the laws of action between conductors carrying electric current. At Laplace's suggestion, a simple electromagnetic telegraph was made and Schilling put it into practice in 1823 in St. Petersburg. By using five needles, each having its own independent circuit; by introducing positive and negative directions for reversal of currents, and by using two or more of these signals; the alphabet could be communicated in a form roughly analogous to our present Morse code.

The eleven short chapters beginning with "Voltaic Electricity Announced," "The Electrochemists," "The Elusive Force," and ending with "Scientist and Citizen," indicate how rapidly this discovery spread over the scientific community. Joseph Henry, eleven years later, was supporting a ton with a battery no larger than that used by Oersted.

Oersted did not rest on his laurels. When he visited Paris in 1823 and learned of Seebeck's experiment, Oersted immediately saw the significance of the experiment and found that bismuth and antimony gave the best results to the experiment that Oersted proposed the name thermoelectric!

The Appendix gives a complete text of Oersted's announcement of his discovery of electromagnetism amounting to roughly 2,000 words, which is reprinted from ANNALS OF PHILOSOPHY, Volume 16, 1820. A bibliography and index complete the book. Bern Dibner is to be congratulated upon making Oersted a more vital figure in the rich heritage we have in Physics.